CONFERENCE PROGRAM

WEDNESDAY, 25 APRIL 2018

1530-1830  PRE-CONFERENCE TUTORIAL - SERIAL ECG ANALYSIS
Chair: Cees Swenne, Leiden University Medical Center, Leiden, The Netherlands
1530-1550  Chair
Introduction to the ISCE 2018 Tutorial “Serial ECG Analysis”
1550-1625  Daniel Guldenring, School of Engineering, Ulster University, Belfast, United Kingdom
Lead interchanges and electrode misplacements, diagnostic consequences and automated correction strategies
1625-1700  Arie C. Maan, Leiden University Medical Center, Leiden, The Netherlands
Diagnostic consequences of analyzing Mason-Likar ECGs, as single ECG and as serial ECG
1700-1720  Break
1720-1755  Cees Swenne, Leiden University Medical Center, Leiden, The Netherlands
Spontaneous ECG Variability
1755-1830  Barry Brown, Mortara, a Hill-Rom Company, Milwaukee, Wisconsin, USA
Could universal ECG comparison be practical in the future?
1830-2030  OPENING RECEPTION, Cash Bar, 1 hosted drink

THURSDAY, 26 APRIL 2018

0815-0830  Welcome and Opening Remarks
Conference Chair - David Strauss, U.S. Food and Drug Administration, Silver Spring, Maryland, USA
0830-1035  Session I: Selected abstracts
Chair Cees Swenne, Leiden University Medical Center, Leiden, The Netherlands
0830-0835  Chair
Overview
0835-0850  Teri Kozik, St. Joseph’s Medical Center, Stockton, California, USA
Repolarization Changes in response to ENERGY drinks in a healthy adults during exercise: The C-Energy-X Study
<table>
<thead>
<tr>
<th>Time</th>
<th>Session/Discussion</th>
<th>Speaker/Institution</th>
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<tr>
<td>0850</td>
<td>Discussion</td>
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<tr>
<td>0905</td>
<td>Raymond Bond, Ulster University, Belfast, United Kingdom</td>
<td><em>Automation Bias and Interpreter Uncertainty when Reading 12-lead Electrocardiograms</em></td>
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<td>0920</td>
<td>Discussion</td>
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<td>0935</td>
<td>John Wang, Philips Healthcare, Andover, Massachusetts, USA</td>
<td><em>Criteria for ECG detection of acute Myocardial Ischemia: Sensitivity versus specificity</em></td>
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<td>1005</td>
<td>Daniel Guldenring, School of Engineering, Ulster University, Belfast, United Kingdom</td>
<td><em>A method to transform 12-lead ECGs to non-standard short-distance ECG leads</em></td>
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<td>1035</td>
<td>Break</td>
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<td>1055</td>
<td>Session II: Big data, Artificial Intelligence and Machine Learning in Electrocardiography</td>
<td>Chair: Jean-Philippe Couderc, University of Rochester, Rochester, New York, USA</td>
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<td>1100</td>
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<td>1115</td>
<td>Long Yu, GE Healthcare, Wauwatosa, Wisconsin, USA</td>
<td><em>P-QRS in machine learning: from raw data understanding to hybrid decision making</em></td>
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<td>Discussion</td>
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<td>1145</td>
<td>D. Masoumeh Haghpahan, iRhythm Technologies, San Francisco, California, USA</td>
<td><em>Cardiologist-Level Arrhythmia detection with deep neural networks</em></td>
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<td>1200</td>
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<td>1215</td>
<td>Jonathan Rubin, Philips Healthcare, Cambridge, Massachusetts, USA</td>
<td><em>Densely connected convolutional networks for detection of atrial fibrillation from short single-lead ECG recordings</em></td>
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<td>1230</td>
<td>Lunch and Afternoon Discussions</td>
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<td>1700</td>
<td>Poster Session 1 – cash bar, 1 hosted drink</td>
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<td>1700</td>
<td>Salah Al-Zaiti, University of Pittsburgh, Pittsburgh, Pennsylvania, USA</td>
<td><em>Beyond the ST-Segment: Novel Methods to Quantify Acute Myocardial Ischemia in Patients with Suspected Acute Coronary Syndrome</em></td>
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<td>Jaume Coll-Font, Northeastern University, Boston, Massachusetts, USA</td>
<td><em>Spatiotemporal Estimation of Activation Times in Cardiac Electrograms</em></td>
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<td>Reza Firoozabadi, Philips Healthcare, Thousand Oaks, California, USA</td>
<td><em>Assessment of Signal Quality Algorithms in Distributed Systems</em></td>
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<td>Shravani Gangidi, University of Rochester, Rochester, New York, USA</td>
<td><em>Impact of Pulse Deficit on Detection of AF Rhythms Using Photoplethysmographic Signals in Reference to ECG</em></td>
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<td>Wilson Good, SCI Institute, Salt Lake City, Utah, USA</td>
<td><em>Novel Metric for Evaluating Ischemic Stress in Electrograms Using a Data-Driven Approach</em></td>
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<td>Richard Gregg, Philips Healthcare, Andover, Massachusetts, USA</td>
<td><em>Reducing the impact of low sampling frequency on heart rate variability</em></td>
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<td>Rohit Hadia, Ulster University, Newtownabbey, United Kingdom</td>
<td><em>K-Nearest Neighbor based QRS delineator for single lead ECGs recorded in lifestyle monitoring Applications</em></td>
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Thomas Hilbel, Dept. of Cardiology, University Hospital, Heidelberg, Germany
*Medical and Safety Issues for Wearable Activity and Heartrate Trackers*

Steven Leung, Weill Cornell Medicine, NewYork-Presbyterian Queens, New York, New York, USA
*Left Arm-Left Leg Lead Reversal Revisited*

Michele Pelter, University of California San Francisco, San Francisco, California, USA
*Is Ischemic Pre-Conditioning Present in Acute Coronary Syndrome Patients with Moderate to Severe Sleep Disordered Breathing?*

Sukardi Suba, University of California San Francisco, San Francisco, California, USA
*Are True Accelerated Ventricular Rhythm Alarms Clinically Actionable or Lead to Untoward Patient Outcomes?*

Iolanna Utochkina, Chelyabinsk Regional Clinical Hospital, Chelyabinsk, Russia
*Heart rate variability as a predictor of outcome in acute stroke*

Mercedes Weir, Virginia Commonwealth University, North Lauderdale, Florida, USA
*ECG Characteristics of Sleep Apnea Patients Undergoing Endoscopy with Deep Sedation*

Yu-Ching Yang, University of Rochester, Rochester, New York, USA
*Heart Rate Recovery, Blood Pressure Recovery, and 24-hour Heart Rate among Firefighters*

Jessica Zegre-Hemsey, University of North Carolina, Chapel Hill, Chapel Hill, North Carolina, USA
*Methods of Interpreting Prehospital Electrocardiograms in North Carolina: A Statewide Report*

Brian Zenger, University of Utah, Salt Lake City, Utah, USA
*PFEIFER: A MATLAB Based Platform for Preprocessing and Autofiducializing Experimental Electrogram Recordings*

1800-1900  
**Dinner**

1900-2050  
**Session III: Device Therapies for Heart Failure and Sudden Cardiac Death**  
(Part 1 - Academic/FDA Perspective and LBBB Challenge)

Chair  
Robbert Zusterzeel, U.S. Food and Drug Administration, Silver Spring, Maryland, USA

Co-Chair  
Brett Atwater, Duke University Hospital, Durham, North Carolina, USA

1900-1905  
Chair  
*Overview of heart failure and overview of session*

1905-1920  
Brett Atwater, Duke University Hospital, Durham, North Carolina, USA
*Cardiac Resynchronization Therapy: Life-Extending Therapy for Heart Failure Patients*

1920-1935  
Discussion

1935-1950  
Kimberly Selzman, U.S. Food and Drug Administration, Silver Spring, Maryland, USA
*FDA Perspective on Assessing the Clinical Benefit of ICD and CRT Devices*

1950-2005  
Discussion

2005--2020  
Robbert Zusterzeel, U.S. Food and Drug Administration, Silver Spring, Maryland, USA
*The International Society for Computerized Electrocardiology ECG Initiative on the Detection of Left Bundle Branch Block*

2020-2035  
Radovan Smisek, Institute of Scientific Instruments of the CAS, v.v.i. and Brno University of Technology, Brno, Czech Republic
*Winner of LBBB Initiative*

2035-2050  
Discussion

2050-2100  
**Break**

2100-2205  
**Session IV: Device Therapies for Heart Failure and Sudden Cardiac Death**  
(Part 2 – Industry Perspective)
## FRIDAY, 27 APRIL 2018

**0830-1200**  
**Session V: Predictive Analytics for Patient Monitoring in Critical Care Medicine: Balancing Alarm Fatigue (part 1) With Novel Predictive Algorithms (part 2)**  
Chair: Marilyn Hravnak, University of Pittsburgh, Pittsburgh, Pennsylvania, USA  
Co-Chair: Christopher Scully, U.S. Food and Drug Administration, Silver Spring, Maryland, USA  
**0830-0835**  
Chair  
**Overview**  
**0835-0850**  
Marilyn Hravnak, University of Pittsburgh, Pittsburgh, Pennsylvania, USA  
"A Call to Alarms: Current State and Future Directions in the Battle Against Alarm Fatigue"  
**0850-0905**  
Bradford Winters, Johns Hopkins University, Baltimore, Maryland, USA  
"Clinical Approaches and Assessment Metrics for Alarm Fatigue"  
**0905-0920**  
Discussion  
**0920-0935**  
Xiao Hu, University of California San Francisco, San Francisco, California, USA  
"Precise Patient Monitoring with Few False Alarms"  
**0935-0950**  
Discussion  
**1005-1025**  
Break  

**1025-1200**  
**Session VI: Predictive Analytics for Patient Monitoring in Critical Care Medicine: Balancing Alarm Fatigue (part 1) With Novel Predictive Algorithms (part 2)**  
Chair: Randall Moorman, University of Virginia, Charlottesville, Virginia, USA  
Co-Chair: Christopher Scully, U.S. Food and Drug Administration, Silver Spring, Maryland, USA  
**1025-1030**  
Chair  
**Overview**  
**1030-1045**  
Randall Moorman, University of Virginia, Charlottesville, Virginia, USA  
"Predictive analytics monitoring at the bedside: Principles and practice"  
**1045-1100**  
Discussion  
**1100-1115**  
Artur Dubrawski, Carnegie Mellon University, Pittsburgh, Pennsylvania, USA  
"Reducing data annotation efforts needed for building predictive models at bedside"
1115-1130 Discussion
Christopher Scully, U.S. Food and Drug Administration, Silver Spring, Maryland, USA
*Regulatory Science for Patient Monitoring Predictive Analytics*

1130-1145 Discussion

1145-1200 Lunch and Afternoon Discussions

1200-1700 Poster Session 2 – cash bar, 1 hosted drink
Brittany Bogle, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina, USA
*Predicted Outcomes and Cost-Effectiveness of Optimally Designed Drone-Delivered AED Networks in North Carolina: Predicted Outcomes and Cost-Effectiveness*

Jimo Borjigin, University of Michigan, Ann Arbor, Michigan, USA
*Accurate detection of atrial fibrillation and atrial flutter using the electrocardiomatrix technique*

Werner Bystricky, AbbVie, Inc., Clinical Pharmacology, North Chicago, Illinois, USA
*T vector velocity distribution: A new biomarker for identifying drug effects on cardiac myocyte ion channels*

Willem Dassen, Maastricht University Medical Center, Maastricht, Limburg, The Netherlands
*Training the Electrophysiologist of the Future*

Dillon Dzikowicz, University of Rochester, Rochester, New York, USA
*Predicting Heart Rate Recovery Based on Depression, Sleep Quality and Vagal Tone in On-Duty Firefighters*

Dillon Dzikowicz, University of Rochester, Rochester, New York, USA
*Relation between QRS-T Angle and Blood Pressure during Exercise Stress Test in On-Duty Firefighters*

Ziad Faramand, University of Pittsburgh Medical Center, Pittsburgh, Pennsylvania, USA
*Understanding the Demographic and Clinical Correlates of Quantitative Repolarization Parameters in Patients with Cardiovascular Risk Factors*

Jorgen Kanters, University of Copenhagen, Copenhagen N, Denmark
*Genetical component of the QT interval is associated with increased mortality in the general population*

Alan Kennedy, B-Secur Ltd, Belfast, United Kingdom
*The effect of automated R-wave annotation on Heart Rate Variability Analysis*

S. Suave Lobodzinski, California State University Long Beach, Long Beach, California, USA
*Novel Universal ECG Sensor for Very Long-Term Monitoring*

Aaron Peace, Department of Cardiology, Altnagelvin Hospital, Western Health and Social Care Trust, United Kingdom
*Decision Making Analysis of Patients ‘Turned Down’ for Primary Percutaneous Coronary Interventions Due to Inapplicable Referrals: A Need for Enhanced Performance in Human and Machine ECG Interpretation*

Dimitrios Poulikakos, Salford Royal NHS Foundation Trust, University of Manchester, Manchester, England
*Associations of T Wave Morphology and Heart Rate Variability with Major Cardiac Events and Mortality in Hemodialysis patients*

Adelita Tinoco, University of California San Francisco, San Francisco, California, USA
*ECG Derived Cheyne-Stokes Respirations and Periodic Breathing a Comparison of 12 versus 7 Leads in Hospitalized Patients*

Peter van Dam, Lucerne University, Institute for Medical Engineering, Lucerne, Switzerland
*The Anatomical View on Mean QRS Axis*
John Wang, Philips Healthcare, Andover, Massachusetts, USA  
**Basic Statistical Concepts Used in Clinical Tests Interpretation and Decision Support: A Review**  
Yu-Ching Yang, University of Rochester, Rochester, New York, USA  
**Heart Rate Recovery and Cardiovascular Risk Factors among Firefighters**

1800-1900  **Dinner**

1900-1950  **Kenichi Harumi Plenary Address**  
Peter Clemmensen, Region Sjaelland - Nykoebing Falster Hospital, Nykoebing Falster, Denmark  
**The Standard EKG in Acute Coronary Syndrome**

1950-2000  **Break**

2000-2205  **Session VII: Jos Willems Early Career Investigators Competition**  
Chair: Mary G. Carey, University of Rochester, Rochester, New York, USA  
Co-Chair: Shen Luo, StarCare Medical, LLC, Madison, Wisconsin, USA  
2000-2010  **Chair**  
**Overview**

2010-2025  **Elien Engels, Maastricht University, Maastricht, The Netherlands**  
*Improved response to cardiac resynchronization therapy using multipoint pacing cannot solely be explained by better resynchronization*

2025-2040  **Discussion**

2040-2055  **Elyar Ghafoori, University of Utah, Salt Lake City, Utah, USA**  
*Atrial Fibrillation Observed On Surface ECG Can Be Atrial Flutter*

2055-2110  **Discussion**

2110-2125  **Jonas Isaksen, University of Copenhagen, Copenhagen, Denmark**  
*T-wave morphology in type 1 diabetes mellitus*

2125-2140  **Discussion**

2140-2155  **Ran Xiao, University of California San Francisco, San Francisco, California, USA**  
*Identification of Ischemic ST Changes through Deep Learning*

2155-2205  **Discussion**

2205-2305  **POSTER SESSION 2 – Continuing Discussion, cash bar**

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**SATURDAY, 28 APRIL 2018**

0830-1005  **Session VIII: Identifying, Diagnosing and Guiding Invasive Treatment for Atrial Fibrillation From Wearable Devices to Electrocardiographic Imaging to Guide Ablation**  
Part 1: ECG and Wearable Devices for Detecting Heart Rate, A-fib and Other Waveforms  
Chair: Michele Pelter, University of California San Francisco, San Francisco, California, USA  
Co-Chair: Loriano Galeotti, U.S. Food and Drug Administration, Silver Spring, Maryland, USA  
0830-0835  **Chair**  
**Overview**

0835-0850  **Kais Gadhoumi, University of California San Francisco, San Francisco, California, USA**  
*Photoplethysmography in wristband and fingertip pulse oximeter: Are we measuring the same pathophysiological dynamics?*

0850-0905  **Discussion**
0905-0920  Marco Peluso, Quardio, Inc., San Francisco, California, USA
Diagnostic value and convenience of wearable ECG technology - an industry perspective
0920-0935  Discussion
0935-0950  Linda Ricci, U.S. Food and Drug Administration, Silver Spring, Maryland, USA
Updates on wearable medical devices
0950-1005  Discussion
1005-1020  Break
1020-1155  Session IX: Identifying, Diagnosing and Guiding Invasive Treatment for Atrial Fibrillation
From Wearable Devices to Electrocardiographic Imaging to Guide Ablation
Part 2: Electrocardiographic Imaging (inverse solution) – Application to Atrial Fibrillation
Chair  Rob MacLeod, University of Utah, Salt Lake City, Utah, USA
1020-1025  Chair
Overview
1025-1040  Miguel Rodrigo, Universitat Politècnica de València, València, Spain
Noninvasive Estimation of Highest Dominant Frequency Regions during Atrial Fibrillation by Electrocardiographic Imaging
1040-1055  Discussion
1055-1110  Joaquin Azpilicueta, EP Solutions, Yverdon-les-Bains, Switzerland
ECGi in AFIB: A clinician wish list
1110-1125  Discussion
1125-1140  John Sapp, Dalhousie University, Halifax, Nova Scotia, Canada
Rapid 12-lead Automated Localization Method: Comparison to Electrocardiographic Imaging (ECGi) in Patient-specific Geometry
1140-1155  Discussion
1155-1700  Lunch and Afternoon Discussions
1700-1900  Session X: Update on International Initiatives and Standards
Chair  Fabio Badilini, AMPS LLC, New York, New York, USA and University of California San Francisco, San Francisco, California, USA
Co-Chair  Brian Young, GE Healthcare, Wauwatosa, Wisconsin, USA
1700-1705  Chair
Overview
1705-1720  Jose Vicente, U.S. Food and Drug Administration, Silver Spring, Maryland, USA
Update on the ECG component of the CiPA initiative
1720-1735  Discussion
1735-1750  Brian Young, GE Healthcare, Wauwatosa, Wisconsin, USA
Updates to IEC/AAMI ECG standards, a New Hybrid standard
1750-1805  Discussion
1805-1820  Jean-Philippe Couderc, University of Rochester, Rochester, New York, USA
Existing and emerging ECG databases: the good, the bad, and the ugly
1820-1835  Discussion
1835-1850  Fabio Badilini, AMPS LLC, New York, New York, USA
Exchange of digital ECGs: do we have enough formats?
1850-1905  Discussion
1915-2200 Dinner Banquet
- Poster Awards
- Jos Willems Early Career Investigators Competition Awards
- President’s Remarks
- Conference Chair’s Remarks

SUNDAY, 29 APRIL 2018
0730-900 Closing Breakfast